

II. Claims 12, 14, 16-19 and 22-24 Distinguish over Kanbe

The Examiner rejected claims 12, 14, 16-19 and 22-24 as anticipated by Kanbe.

The Examiner argues:

Kanbe et al. disclose a magnetic recording medium having a substrate formed from a NiP-plated Al alloy, a first underlayer formed from a Cr alloy, a second underlayer formed from a Cr alloy containing B used to reduce grain size of an overlying magnetic layer and thereby reduce media noise, a non-magnetic Cr-containing alloy (CoCr alloy), and a (sic) magnetic layer thereon. The reference also teaches that a non-magnetic coupling layer and an additional magnetic layer can be deposited to form an anti-ferromagnetically coupled recording layer structure. See col. 6, line 39 to col. 7, line 9 and claim 1.

Office Action, ¶4. Applicants have amended claims 12 and 19 to overcome this rejection. Claim 12 now recites that the third underlayer has a bcc crystal structure.

Assuming that the Examiner considers the “Co-containing hcp structured non-magnetic alloy layer” (col. 6, lines 64-65) to be a third underlayer, since that layer must have a hcp crystal structure, and Applicants’ third underlayer has a bcc crystal structure, Kanbe no longer anticipates or renders obvious claim 12. Claims 14, 16-19 and 22-24 distinguish over Kanbe for at least this reason as well.

III. Claims 1-24 Distinguish over Wong Combined with Kanbe

The Examiner rejected claims 1-24 “under 35 U.S.C. 103(a) as being unpatentable over Wong (US 6645551) in view of Kanbe et al. (US 6830837).” Office Action, page 3.

The Examiner argues that Wong suggests two or more bcc underlayers comprising Cr (citing to Wong, col. 3, lines 31-32) that can be alloyed with various materials. The Examiner acknowledges that Wong fails to teach or suggest boron. However, the Examiner argues:

Kanbe et al. teaches that it is known in the art to add B in small amounts to bcc Cr alloy underlayers in order to reduce medium noise. It would have been obvious to one of ordinary skill in the art at the time of invention to add B to the Cr alloy underlayers taught by Wong in order to reduce medium noise...

Office Action, page 4. Applicants traverse this rejection for at least two reasons.

A. Kanbe Only Teaches Adding Boron to the Uppermost Cr bcc Underlayer

Kanbe teaches a first embodiment “in which a bcc structured second underlayer containing Cr is stacked on a first underlayer made of a non-magnetic and amorphous alloy....” Col. 5, line 67-col. 6, line 3. Kanbe observes that the “addition of B deteriorates the crystalline structure of the underlayer....” Col. 6, line 52-53. In order to overcome this problem, Kanbe advocates dividing the second underlayer into first and second sublayers. The first sublayer lacks boron, and the second sublayer contains boron. See Kanbe col. 6, lines 55-62. Thus, Kanbe teaches that boron should be in the *uppermost* bcc Cr underlayer.

Even if one skilled in the art were to combine Wong and Kanbe to arrive at a structure comprising three Cr underlayers, the resulting structure would comprise boron in the uppermost Cr underlayer. There is nothing in Wong to teach or suggest putting boron in the middle Cr underlayer (or making the uppermost Cr underlayer boron-free). Therefore, the combination of Wong and Kanbe does not teach or suggest Applicants’ claimed invention.

B. Applicants Achieve a Surprisingly Superior Result That is Neither Taught Nor Suggested by Kanbe or Wong

The present application teaches that by providing boron in the middle bcc Cr underlayer instead of the uppermost bcc Cr underlayer one can improve the media noise characteristics. See the experimental data contained in Application Table V on page 9.² Nowhere do Wong and Kanbe teach or suggest this surprising result. Therefore, claims 1-24 distinguish over the combination of Wong and Kanbe.

IV. Claims 3, 4, 13, 20 and 25-35 are Patentable Over Kanbe Combined with Wong

Claim 3 recites: "Medium of claim 2 wherein said first and third underlayers substantially lack boron." Again, Kanbe suggests that one should provide boron in the uppermost bcc Cr underlayer. In other words, Kanbe teaches *away* from Applicants' claim 3. There is nothing to teach or suggest providing boron in the middle bcc Cr underlayer while making the uppermost bcc Cr underlayer boron free. Therefore, claim 3 distinguishes over Kanbe and Wong.

As mentioned above, Applicants achieve a surprising improvement in the signal to noise ratio by providing their third boron-free Cr bcc underlayer. See Application Table V and the attached Declaration of Sudhir Malhotra. Neither Wong nor Kanbe suggest this result. Clearly, this surprising benefit of Applicants' invention further demonstrates the patentability of Applicants' claimed invention.

² This data is discussed in the Declaration of Sudhir Malhotra submitted herewith.

As claims 1-35 distinguish over Wong and Kanbe, Applicants earnestly request that the Application be allowed. If the Examiner's next action is other than allowance, the Examiner is respectfully requested to telephone Applicants' attorney at (408) 732-9500.

Respectfully submitted,



Kenneth E. Leeds


Reg. No. 30,566

Attorney for Applicants

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on March 1, 2006.

March 1, 2006

Date



Signature